

FURTHER *a. 59 38 8/12*
OBSERVATIONS

Intended for Improving the

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LTURE and CURING

O F *467. c. 34*

INDIGO, &c.

I N

SOUTH-CAROLINA.



L O N D O N :

Printed in the YEAR, MDCCXLVII.

Account of INDIGO and OLIVE-
OILS, imported into ENGLAND
from *Christmas* 1733, to *Christmas*
1745.

From <i>Christmas</i> 1733 to <i>Christmas</i>	Years	Indigo Pd.wt.	Oil Ordin. Tons H. G.			Oil Salt Gallons.
	1734	689,039	4279	3	44	66999
	1735	591,092	3327	3	23	40779
	1736	436,392	2471	1	14	78085
	1737	737,022	3811	0	46	65085
	1738	849,611	4422	2	30	52096
	1739	735,239	1126	1	7	7744
	1740	735,419	3319	1	57	17848
	1741	663,951	3223	3	50	36627
	1742	681,267	711	0	26	14178
	1743	783,053	3376	0	8	70015
	1744	532,947	4168	1	35	67699
	1745	746,627	2038	3	54	51488
		8181,659	36277	0	36	568643
	1733		4805	3	23	68750
Total		8181,659	41082	3	59	637393
At a Me- dium is }		681,806	3160	0	43	49030





FURTHER
OBSERVATIONS
INTENDED

For improving the Culture and
Curing of INDIGO, &c. in
South-Carolina, &c.



S I R,

ITS with Pleasure I can inform you, that I have seen above 60 Casks of *Carolina* Indigo; and that great Part of it seems better than any we have from *Montserrat*, *Jamaica*, or any of our *West-India* Colonies; and I do not question but you will soon make it equal in Goodness to any from the *French* Islands, if proper Care is taken by the Planter to make, and Exporters to buy, only what is good, and detect all Frauds of false Package, Mixtures, &c. It is for the Benefit of all concerned, I have made the following Observations,

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servations, which I wish may prove of Service in promoting this valuable Commodity in *Carolina*.

The Consumption of Indigo in *Great-Britain*, is on a Medium of 13 Years, *viz.* from 1733 to 1745, by the Custom-house Books, imported 681,804 *lb*; but as it pays no Duty, so more is often entered than is really imported; and it is presumed the real Consumption is about 500,000 *lb.* every Year; which at the usual Price in Time of Peace, being 3*s.* is 75000*l.* at 4*s.* is 100,000 *l.* *per Annum*, Freight and Charges being a Trifle, it is almost all clear Gain to the Planter.

It is also of Demand in *Germany* and *Holland*; but is no where dearer than in *London*, which is the greatest and best Market for it in the World.

There is three different kinds of Indigo, and applied to different Uses, *viz.* that called Copper Indigo, which when broke, shines something like Copper, without being rubbed, is most in Demand in *England*, and used by all Dyers of Woollens. The Consumption of it is more than of both the other kinds; it is esteemed better or worse, the more or less it appears to shine when broke, for such as shines only when rubbed is much worse, and even of that Kind it is esteemed the more or less it shines when rubbed; and what will not shine when rubbed is of the worst kind, and inferior to the best by 1*s.* or 1*s.* 6*d.* the Pound.

That called Purple Indigo, looks more of a Purple Colour when broke, than the Copper-kind;

kind; but does not shine unless rubbed; it is used mostly by Foreigners, and here to mix with Starch, &c. by our Blue-makers for Sale to Families, and others who wash or whiten Linen; it is in most Demand in all Countries where Linen is made; but not in such Demand, as the Blue or Copper.

The Blue Indigo looks of a fine strong Blue Colour when broke, and if rubbed looks like polished Copper, it is always very light, and when broke seems to have a Body like Chalk; it is used mostly by Dyers of Silk, Linen, and Thread, Callico-Printers, and all fine Goods, and much in Use, both here, in *Germany*, and in *Holland*, and indeed will serve for all Uses in the Dying way.

There is great Variety of each kind of Indigo, but all the kinds have some general Rules to know Good from Bad, *viz.*

The good Qualities are, the more Shew of Metal at breaking the Copper, or rubbing the Blue or Purple.

The lightest of each particular kind, by which it will not feel heavy in the Hand, or look to be shrunk up, or its Body contracted by any Art, the being free of any kind of Mixture, or remains of Stalks or Weed, the being whole and free of Dust.

Of Course the reverse of these are bad Qualities.

The only and indeed almost a general Fault, found with all that would be otherwise good Indigo from *Carolina* this Year is, that it is made too hard, flinty or brittle in the outside,

and not fully cured in the middle, or is all over so hard and brittle, and the Body of the Dye so confined, that it be cannot be so well extracted in the common Method of Dying; whether this is owing to the using too much or too little Lime-Water, or to it is being exposed to the Sun, after cut in Pieces, which hardens the outside Part of it too soon, I cannot say, nor can any I have spoke with on this Subject inform me, though I am told no Lime-Water is used at making any in *Jamaica*, or by the *French*.

There is a kind of Trash mixed in many Casks of Indigo from *Carolina*, that is black and spungy, looks like Indigo at a Distance, but when in Hand is to be compared to a burnt Coal or Cinder, or like a Black Spunge, Pumice-Stone, or Rotten Turf; it is very light, and with a small rub in your Hands will crumble to Pieces or Dust; as it is of no Value, so being mixed with any other, is a great Hurt in the Sale, even much more than if entirely thrown away. Almost all, of even the best from *Carolina*, has a thin Skin or Glazing on it, a sure Sign of its being too soon dried, by which the middle of the Stone or Piece is not thoroughly cured, and is a bad Quality none of the *French* has, being all the same, and equally soft outside as inside of every Stone.

There is also a good deal made, that looks of a muddy and very dark Blue, as if mixed with Earth, does not when broke nor even when rubbed, make any shew like Metal, this is always heavy, and you may be assured is not worth

worth much above half the Price ; I presume it is occasioned by the Leaves, Stalks, &c. being kept fermenting too long, in order to have the larger Quantity of Indigo. I observe in some Casks of Indigo, a good deal of a very light or pale Blue Colour, which not being natural to Indigo, gives a Suspicion of a Mixture of Flower or Starch, and will not sell as a mercantile Commodity.

As there is a great Variety as to Quality, I mean good and bad in each kind of Indigo ; so the Buyers should observe that what is packed in one Cask, must be as near as possible all of the the same Quality ; but at all Rates all of one Species ; I mean, either all Purple, all Blue, or all Copper Colour, observing that if there is found to be a considerable Difference in the Quality, the whole Cask, although two Third Parts be fine, and one Third Part ordinary, will sell as ordinary ; but if Two or Three Planters Indigo is of near the same kind they may be put in the same Cask mixed.

As the *French* Indigo has been most esteemed for many Years, and the Goodness of it known to all Consumers, it will be most proper to make all the Indigo as near as possible to their Size of Stones, which are commonly about one and a half Inch long, one and a Quarter broad, and one Inch thick, or of one Inch Square, or one and a Quarter Inch long, one Inch broad and Seven Eighth or Three Quarter Inch deep ; either of these Sizes will do for Sale, and I presume is of proper Size for drying ; but you will observe, I mean of these Sizes when dry and ready for Sale,
for

for what this Size is when wet, I don't know.

There is another kind made chiefly by the *Spaniards*, which is all in small Pieces about the Size of a Nutmeg, some smaller, of which I had about 4 lb. in three Patterns from *Carolina*, that is equally esteem'd, and possibly may answer better for your curing; this Shape passes here as *Spanish Indigo*, the finest *Guatimalo* is made up in that manner^c.

I am sorry I can give you no further Help in the Culture or curing of Indigo than what is hereto annexed, which I have received from two Gentlemen, who are very ready with their Assistance to improve this Commodity.

The first Letter is from a good Judge of Indigo, and long used to deal in it.

The second and third is from a Gentleman already well known to those who are curious in Gardening and Botany; and altho' many of his Observations have been already printed, yet I chuse to annex the whole in his own Words to prevent Mistakes. But those who follow the same Method as was observed by Colonel *John Bee*, Mr. *James Stobo*, Mr. *Robert Sams*, Dr. *John Linning*, Dr. *George*

^c It is proper to observe, that when most of the *Carolina* Indigo arrived this Year, the *French* was both scarce and dear; and as in all such Cases a bad Commodity sells above its real Value, so a proper Difference was not made by the Buyers; so that what sold within 6d. per Pound of the best this Season, would not sell when it is in plenty within 12d. per Pound, there being at least 2s. Sterling the Pound Difference between the best and worst shipped this Year from *Carolina*.

George Mitchell, *Mr. Isaac Haynes*, *Charles Pinkey*, Esq; and *John Hudson*, whose Indigo I have seen, and know to be good, and who are mention'd in course, as I judge their Indigo is in Goodness, viz. *Mr. Bee's* the best, tho' there is 6*d.* per lb. Difference, even in their Indigo. I say those who observe the Method followed by these Gentlemen, if nothing extraordinary happens, need not fear making it good, providing it is not of so hard a Body and flinty, and of course feels so heavy, nor looks as if glazed on the Outside, which is the only Fault in their's.

As for those who are so weak to prefer making a large Quantity of bad, rather than a smaller of good Indigo, they will soon find the Difference in the Sale, and should be deemed Enemies to their Country; as it was by the same Practice the Indigo Trade was lost to our *West-India* Colonies, and indeed so much bad from *Carolina* this Year has already hurt its Credit.

As there is so many customary Allowances in Tare, Draft, &c. and charges on every Cask needless here to mention, which is almost the same on a large or small Cask, I can demonstrate that there is a real Difference of 4*l.* Sterling on 2000 lb. of Indigo, being sent for Sale in four large, or in ten small Casks, and therefore advise the sending none in Casks smaller than a Rice-Barrel; the best Size Casks is to hold about 450 or 500 lb. of neat Indigo; and, if larger, to be the Size of Pipes or Puncheons to hold from 7 to 800 lb.

On

On the smallest Cask no Weight is paid for less than 1 lb. so that on a Cask of 100 lb. there is lost the odd Weight in Tare, if 15 3. in Gross, if 15 3. and in Draft is always 1 lb. besides Samples broke and lost, &c.

Most of the Indigo we have from *France* comes in Pipes, and on them often Iron Hoops for Security; in place of which most from *Carolina* this Year has been in common Flower-Casks, or common Rice-Barrels, by which Neglect a good deal is lost. Surely so good a Commodity deserves good tight Casks.

I observe those who have made the best Indigo have also been careful to pack it in good Casks; and some bad has been sent in any old Casks not sufficient for Rice, altho' the real Value of 1 lb. good Indigo will during the War be equal to 100 lb. Rice.

In case you should have two kinds of Indigo not proper to mix, it would be the best Method to put the smallest Quantity in a Bag, and the largest loose about in the same Cask.

The Casks should be made of season'd Wood, and exactly weigh'd when empty; then the Tare marked on it, and after filled with the gross Weight of each taken, else if any is stole at Sea, or in the Lighters, there is no recovering it of the Ship.

As Indigo pays no Duty the Officers are not very exact in the Weight, so it is not shifted and tared on the Keys as Rice is; and as the Freight is paid by the Pound, they are too apt to adjust the Tare in favour of the Ship,

Ship, which makes it needful to have the real Tare marked on the Head of each Cask.

It is also needful on many Accounts for every Shipper of Indigo, not only to send an exact Invoice of the Mark, Number, Gross, Tare and Nett Weight of each Cask of his in the Ship, but also sundry Invoices and Bills of Loading in some other Ships, in order to recover his Interest by, in case it is lost or taken, if he is insured, or for his Correspondent to claim his Property if the Ship should be taken and re-taken, which often happens, and cannot be otherwise recovered.

Indigo is commonly sold at three Months Credit, the Buyers are mostly rich Men, and the Port of *London* is the best Market for it; during the Continuance of this War there is no Danger of its falling under 4*s.* per *lb.* unless we should take the *French St. Domingo* Fleet.

I wish some Method were thought on to have an Account kept of all made in *Carolina*, and shipped off last Year and this; so as it might be sent to *London*, and laid before the proper Officers, as the Introduction of an Application to Parliament for a Duty to be laid on *French*, and a Bounty granted on, *British* Plantation made Indigo; if 4*d.* per *lb.* Duty, and out of it to be paid 2*d.* per *lb.* Bounty were allowed, it would make a Difference of 6*d.* per *lb.* Gain to the *Carolina* Planters; and I am persuaded will be granted for seven Years, providing the Province Agent is instructed to apply for the same; and that it should appear probable you can make what's

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needful

needful for the Use of *Great-Britain*, which I think is not to be doubted.

As it is probable the Drill Plow may be useful in the Culture of Indigo, I proposed to send one or two by Ships now going for *Carolina*, but cannot find any such Thing is made in *London*; however I hope to have one to go in the next Ships, which may serve as a Model to make others by, if found of Service, and will for that Purpose be sent to the publick Treasurer.

I wish any Gentleman would ship home a little Cotton for Trial, which is known to grow well in *Carolina*, and is now worth double the Price it was six Years ago, *viz.* from 12 to 20*d.* the Pound, as in Goodness. It pays no Duty, and excepting Freight, which may be 1 $\frac{1}{4}$ *d.* or 2 *d.* *per lb.* there is scarce any Charge on it here: For on a Bag, which is commonly 200 *lb.* Weight, the Charges are not 2*s.* for Landing, Housing, &c. and Warehouse-Rent is only 3*d.* a Bag *per Week*. It is of constant quick Sale for ready Money, or six Weeks Credit, and vast Quantities of it is consumed yearly in *Great-Britain*.

I am surprized none in *Carolina* attempt making of Cordage, of which a great Value is shipped from hence for *Carolina* and the *West-Indies* every Year. Hemp, I am told, grows well there, and we know Tar is no where cheaper; it is a simple Manufacture, few Tools required, and easily taught even to Negroes. The Freight and Insurance out on Cordage, now sold at 34*s.* *per Hundred*, would be all saved to the Makers, which is at least 30
per

per Cent. on the Cost, supposing Hemp even at *London Price*, of course it must answer for the Province Use, as well as exporting to the *West-Indies*.

Copies of the Letters referred to as above.

S I R,

IN Answer to your Letter and Queries about *Carolina Indigo*, what appears to me to be the greatest Defect, is the Brittleness of that Sort, which generally has most of the other good Qualities to recommend it, and I heartily wish I could think of some Expedient entirely to remedy that Difficulty. In order therefore to cure the Disease, we must, like a good Physician, endeavour to find out the Cause, which being removed, the Effects will naturally cease.

The Cause then, in my Opinion, is either being dry'd too hastily, after the Part is reduced to a proper Consistency for that Purpose, or using of Lime-Water in making the Indigo in the Vats. If it should happen to be the former, which I most suspect; for if it be dry'd over hastily, the Outside will certainly crack and fly into a great Number of irregular Seams or Crevices, which on the least Attempt to break, or try the Goodness of the Commodity, divides itself, and crumbles into small, roundish, and square Pieces about the Bigness of Horse Beans, with grey, mouldy, or dull Edges, without discovering the bright metallick Substance, or Copper Colour, which you know

is the distinguishing Characteristick of good Indigo; and yet those very Pieces being again broke and try'd, in such Places as happen to be well cured, it has all the good Qualities that need be desired, the Smallness of its Size excepted, and that of itself you know sufficiently decreases its Value.

To remedy which, and the other bad Properties above described, I would recommend to the Planters a very slow, easy, regular Rule of drying it, particularly when the Part is taken out of the Vats, and laid on Boards, or other proper Materials for that Purpose, which should at first be placed in some cool dry Place, far from the Wind or Sun; and after remaining some Days be turn'd, and mov'd by Degrees to a drier Place, and so repeated, till it cement itself gradually together without cracking, which I doubt not will happen, if this Method be carefully followed.

If Lime-Water be the Occasion of its Brittleness, it must be owing to too great a Quantity being put in, which can only be rectified by Experience; but Lime-Water may be left entirely out without any Prejudice to the Process of Indigo-making, except that of its being a few Days longer in settling in the Vatts. This I have been told; but how far it may square with the Opinion and Experience of your Friends, in *Carolina*, I know not; but I think you would do well in recommending some of your Correspondents to a Trial of
both

both Ways, and advise them to communicate their Observations and Success to their Neighbours.

London, 20 June, 1747.

To Mr. J. C.

Chelsea, 20 May, 1747.

S I R,

I AM greatly obliged to you for the Seeds and Samples of Indigo you was so good as to send me. The Seeds I have now sown in order to see what the Plants will prove, from which the Sorts of Indigo are made. The Sort cultivated by the *French* and *Spaniards* I have frequently cultivated, as also the wild Sort of the *Islands*, which is very different from the other; but how the *Carolina* wild Sort differs from these is what I want to see. As this Commodity is likely to be a considerable Improvement to the Lands in *South-Carolina*, and a Benefit to the Kingdom; so I shall be glad to give any Assistance in my Power to promote the Culture and Manufacturing of it; and accordingly will draw up the best Account of this from the several Materials which I have been furnished with by the *French*, and my Observations for several Years, made on some few Plants which I have cultivated at *Chelsea*; and shall beg the Favour of you to transmit it to some of your Friends in *Carolina*, which I believe may be useful to them. The Use of Lime-Water
must

must be absolutely laid aside, for the *French* and *Spaniards* only use common Water, and that of Rivers which is soft is always preferred to any other.

To Mr. *J. C.*

Chelsea, 17 July, 1747.

S I R,

I Herewith send a you few Observations on the Indigo which are drawn up hastily, so not fit for the Press; but should be glad to have them made as generally useful to the Planters in *Carolina* as possible for the Public Use. And as I have Leisure, I shall collect together what Observations and Experiments I can meet with, and also by examining the different Species of the Plant now cultivated in *Carolina*, of which I have several Plants now growing, from the Seeds you was so kind as to send me, I may be enabled to give a more perfect Account hereafter: in the mean Time if any Thing should happen in your Way, I shall be greatly obliged for any Communications, and if I can any how be of Service in promoting this Branch of Trade, you will do me a Pleasure in favouring me with your Commands.

I am, &c.

PHILIP MILLER.

To Mr. *J. C.*

The Observations referred to in the above Letter, are as follows, *viz.*

INDI-

INDIGO is composed of the Salt and Substance of a Plant of the same Name, the whole Plant is steep'd in Water, where, by the Fermentation and Beating, the Plant is intirely dissolved, and the coagulated Mass, which settles to the Bottom of the Vat, is the Indigo. There are several Species of this Plant, but that which is generally cultivated by the *French* and *Spaniards* seldom grows above two Foot and a half, or three Feet high; whereas the wild Indigo of the Islands grows five or six Feet high; from this wild Sort I have been informed there has been as good Indigo produced, as from the cultivated kind, but this requires a farther Examination. The Plant from whence the *East-India* Indigo is produced is different from either of these; tho', from what I have been able to examine from a few Plants which grew in the Physick Garden, it is not better than the Sort cultivated by the *French*, so that the Goodness of the Commodity is chiefly owing to the Time and Care of making.

As the Quantity and good Quality of the Indigo depends on the Strength and Vigour of the Plants, so I shall begin by giving Instructions for cultivating of the Plant, so as to have it in the greatest Perfection.

The Land designed for Indigo should be very good, and as clean as possible from Weeds: This Land should be well ploughed and harrowed, to break the Clods, and make it fine, before the Seed is sown. The Season for sowing the Indigo is in the Spring, as soon

soon as the cold Weather is over ; for as the Plant is impatient of Cold, so if a slight Frost should happen when the Plants are come up, the whole Crop will be intirely destroy'd thereby ; and if cold moist Weather should happen after the Seeds are sown, they will rot in the Ground, and never come up. The best Method of sowing the Seeds is to make Drills about half an Inch deep, either with a Hoe, or a drill Plow, at about a Foot and half distance from each other, and scatter the Seeds thin in the Drills, then draw the Earth over the Seeds, so as to bury them about half an Inch deep. In a Fortnight, if the Weather proves good, the Plants will begin to appear above Ground ; and in about a Month after sowing, the Ground should be carefully houghed over, to destroy the Weeds ; for in keeping the Ground perfectly clean between the Indigo Plants, greatly depends the Goodness of the Crop. At this Time, if the Plants are come up too close in the Rows, they should be thinn'd, because when the Plants grow close together, they draw up weak, and their Leaves, which afford the best Indigo, are small and ill nourished ; and the lower Leaves, which (when the Plants have proper Room) are always the largest and fullest of Juice, do soon change to a *feuille morte* Colour, i. e. Colour of a dead Leaf, and renders the Indigo less fine, and it will also be in small Quantities ; for it is in Indigo, as in the Wood, where the Plants are vigorous, and have the largest and fattest Leaves, it is always most esteemed ; for altho' the Stalks do afford

Part

Part of the Dye, yet it is always in less Quantity, and not of so good Quality as the Leaves; and the harder and more woody the Stalks are, the less Quantity the Plants do afford of the Dye, and the Quality is also worse. Therefore whoever has a mind to improve the Quality of their Indigo, should be careful to cut the Plant before the under Leaves begin to decay, which they always will do, by the Time the Plants begin to flower; so that the surest Time to cut the Plant, is when the Flower-Buds begin to appear.

If the Ground is well husbanded, and kept clean from Weeds, the Plant will afford two Crops in a Season, which is as much as should ever be expected from the same Plants; for altho' they have sometimes taken three or four Crops from the same Plants, in the Islands, yet they constantly found the last Crops much less in Quantity, and greatly inferior in Quality to those of the first Growth.

When the Plants are fit to cut, the Work should be done with as great Expedition as possible; because when the Plants are cut, and laid together in Heaps, they will soon heat, and thereby the Colour of the Leaves will be changed, and the Indigo render'd less beautiful; therefore as fast as the Plant is cut, it should be carried to the Vat, and put therein, and covered with Water, and the sooner the Vat is filled with the Plant the better it will be, because the whole will ferment together, and thereby be dissolved more equally; the Water

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which

which should be put into the Vat should be taken from a River, which is soft.

When the Plant is fit, it should be cut with crooked Knives, shaped like Pruning-knives, or Sickles, with these the Plants are cut about two Inches above Ground; and as it is cut, it should be carefully laid into coarse Cloths, being careful not to mix Weeds or Dirt with the Plant; and when the Cloths are filled, they may be tied up by the four Corners, and so carried to the Steeper; by this Method none of the shorter Shoots of the Plants will be lost, and there is less danger of bruising the Plant, and the Work will be performed quicker. About eighteen or twenty of these Packets, will be as much as can be put into a Steeper of a moderate Size; when the Plant is put into the Steeper, it should be filled with Water so as to cover the Plants, and some Pieces of Wood laid over the Plant to keep it from buoying up above the Water; then it must be left to ferment, which is sooner or later in Proportion to the Season, and the Ripeness of the Plant; but in about ten or twelve Hours, the Water will heat and boil up on the Sides of the Steeper, and change to a dark muddy Colour, which afterwards changes to a blue or violet Colour. Then without meddling with the Plants, they open the Cocks which are at the Bottom of the Steeper, and let all the Water, loaded with the Salts and Substance of the Plant, which was freed by Fermentation, run into the Battery, then they throw away the Plant as useless, being almost rotten

rotten, and clean the Steeper to be again filled with fresh Plants ; then the Water must be beaten which was let out of the Steeper into the Battery. For this Purpose some use a Wheel made in the manner of a Water-mill, whose Axis is placed upon the middle of the Vat, which is turned by two Handles placed at each End of the Axis ; others have used Boxes bored full of Holes, which were moved up and down by Pullies, in short any Instrument may be used which will stir the Water with Violence, whereby the Salts and Substance of the Plant may be brought together and coagulate. The critical hitting of the Minute, shews the Skill of the Overseer of the Indigo ; for if they leave beating too soon, the Grain will remain dispersed in the Water, so will not settle to the Bottom, but is carried away with the Water, when that is let out of the Beater, whereby a great Quantity of the Indigo is lost ; or if when the Grain is formed, the beating be continued, it will be dissolved, and so liable to the same Inconvenience.

In examining the Water they use a little Silver Cup, this is filled with the Water taken out of the Battery, while the Beating is continued, and as the Fæces sink to the bottom of the Cup, or remain dispersed in the Water, they cease or continue beating. When they leave off beating, they let the Matter rest, that the Fæces may sink to the bottom of the Vat, then they open the Cocks which are placed at different Distances from the Bottom, and let all the Water out of the Vat, after

which the Fæces is let out into the Settler, where it is left for some time to settle ; then the Fæces is put into Linen Bags of eighteen or twenty Inches long, which are suspended to let the Water entirely off ; when that is done, they spread it in little Boxes, three Feet long, two broad, and three Inches deep, which are exposed to Air in a shady Place, that the Indigo may be perfectly dry ; but there must no Wet fall upon it, for that will dissolve it ; and if it is exposed to the Sun the Colour will be greatly faded thereby.

The *French* do always observe to place their Indigo Works near a River, where the Water is clear and soft.

The Vats are built either of Brick or Stone and well cemented ; the Lime of the Cement is commonly made of Sea-shells, which when calcined do make a very durable Mortar. These Vats are built like a Cascade, there being Three one above another ; in the upper Vat the Herb is put to ferment and digest ; the second Vat is placed below the Bottom of the upper, that it may receive the Liquor contained in the first, when the Holes are unstopped which are contrived in the Bottom of the first ; and the third Vat is placed as much below the second, to receive in like manner what is contained in the second. The first which is the largest and highest of these Vats, is called the Soaker or Boiler, which is commonly made twenty Feet long, twelve or fourteen broad, and four Feet deep ; the second is called the Battery, this is little more than
half

half the size of the first; the third which is much less than the second, is called the Young Devil. The Names of the first two perfectly agree with their Use; for the Herb is laid to steep in the first, where it ferments, is macerated and becomes like rotten Dung, after the Salts and Substance of the Plant is diffused in the Water, after the Fermentation of the Plant which is excited by the Heat. It is in the second that they agitate and beat this Water impregnated with Salts of the Plant, till having collected, reunited, and as it were coagulated them with one another, they form the Particles which compose the Dye. The third Vat, which is frequently called the Settler, in some of the Islands, which Name also agrees perfectly well with its Use, because it is in this the Indigo which was begun in the first, and perfected in the Battery, unites, grows into a Mass, separates from the Water which remained in it, and settles to the Bottom of the Vat, whence it is taken out and put into the Bags, to drain, and afterward into the Boxes.

Great Care should be taken in building these Vats substantial, for the Strength of the Fermentation is so great, that unless the Masonry be very well done, and the Mortar carefully chosen and wrought, they will crack, and a very moderate Crack is sufficient to let out a Vat of Indigo.

But whenever such a Misfortune happens, the following is an easy and infallible Remedy. Take some Sea-shells, pound them without burning, then sift them through a fine Sieve; take an equal Quantity of Quick-lime and sift it,

it, mix these together with Water enough to make a stiff Mortar, and as quick as you can stop the Cracks of the Vat with it; this Mixture will incorporate, stick and dry in a few Moments, and prevent the Matter running out of the Vat.

The Indigo which is made in the *East-Indies*, is from a very different Plant than either of those used in *America*, if the Seeds which were brought me from thence, were rightly chosen; for from those Seeds I raised several Plants in the Physic-Garden, which flourished very well, and produced their Flowers, but did not perfect their Seed. This was a trifoliate Plant, and seemed not likely to afford so much of the Dye, as those Sorts used in *America*. And if what I have been informed (in Relation to the making of the Indigo in the *East-Indies*) be true, the Goodness of their Commodity proceeds from their Care in cutting of the Plant young, before the under Leaves decay, and the Stalks become lignous; as also in being careful that no Dirt, Sand or other extraneous Matter be thrown into the Vat with the Herb, or is otherwise mixed with it. I have also been informed by some Planters of *Jamaica*, who have cultivated the *Indigo*, that they have frequently made Use of a wild Sort of *Indigo*, which grows spontaneously in the Islands, and is much less subject to miscarry than the cultivated kind, from which they have made very good Indigo; but these Things require farther Trials, and these should be made with great Care, before any Thing can be asserted

ferred about them. From the Specimens of Indigo which I received, that called the *French Indigo*, appears to be the finest Colour, though the *Guatemala Indigo* has generally been preferred to it. Therefore I should be glad to be informed, what Certainty there is of the Sort now cultivated in *South Carolina*, being the true *Guatemala Indigo*.

I have raised Plants of all the three Sorts in the Physic-Garden; but fear they are too backward to perfect their Seeds, therefore beg to have two or three Specimens of each kind, carefully dried in Papers, when they are in Perfection, so as to have Flowers and Pods, that I may ascertain their specific Difference.

As to the Culture of the Plant, I shall only add, that as the Inhabitants of the Colonies, complain that the sowing of the Seeds by Hand is so very troublesome and laborious, so this may be remedied by a Drill-plow, with a Hopper to scatter the Seeds, so that the whole may be performed by one Operation.

By the Specimens of the Indigo which I received, I find that Lime has been used to cause the Indigo to subside; but this causes the Particles of Indigo to unite so closely, that the Indigo will not so easily dissolve, therefore this must be avoided for the future; and nothing but pure Water put to the Herb, and this not in too great Quantity, therefore the best way is to fill the Steeper first with the Herb, and then put only so much Water into it, as is sufficient to cover it, for if there is too much Water, the Herb will not ferment near
so

so strongly, as when there is just enough to cover it.

Another Caution should be used, which is never to cut the Herb in a Wet Season; nor must the Planters in *Carolina* attempt to make Indigo late in the Autumn, for as the Cold increases, so the Plants will be less ripe, therefore will not ferment so strongly; nor will the Fermentation be carried on properly in a cool Season. Therefore in Order to bring this Branch of Trade to its Perfection, it will be of great Concern to try the different Sorts of *Indigo* with the utmost Care, to make the Commodity as pure and fine as possible; and never to attempt cutting the Herb more than twice in one Season from the Perennial Sort, and always to sow the *French* and *Guatemala* Indigo's every Year, for when the Plant is not vigorous, the Dye will not be so good, nor in so great Quantity. I do also conjecture from some analogous Experiments, that the first Crop, will always produce a greater Quantity of Indigo, and of a much better Quality than the second; for we constantly find that all Sorts of Herbs used in distilling, do afford a greater Quantity of Spirit, and of a better Flavour, from the first Crop, than from what is afterward produced from the same Roots; and if the same is found in making of the Indigo, I should advise the taking but one Crop from the same Roots, and then destroy them. I believe it will be absolutely necessary to change the Soil every Year, and not sow the Indigo two Years successively on the same Ground, and as there

there is Land enough in *Carolina*, so there need be no Difficulty on this Head.

Another Thing must be repeated here, which is to be very careful in keeping the Ground perfectly clean between the Rows of *Indigo*; as also not to let the Plants grow too close together, which w^{ill} cause them to run up tall, but prevent th^{er} Leaves from being so large and fine as where they are thinner.

From these few Hints, if proper Experiments are carefully made, there is no great Reason to doubt but that this Business may be brought to as great Perfection in *South-Carolina*, as in any of the *French* Settlements.

I have now given you all my own Observations on *Indigo*, as well as what I have been able to get from others; and shall only, add that the Province is indebted to Mr. *Philip Miller*, Author of the Gardener's Dictionary, Keeper of the Physic Garden at *Chelfea*, and F. R. S. for most of the Observations on *Indigo*, in a former Pamphlet, which were chiefly extracted from his Gardener's Dictionary; and as he did not know of that being printed when he wrote the above, so it is the Reason of many Paragraphs being almost the same. On the whole, I hope some of these Thoughts are new, and may be useful in assisting the Planters in *Carolina*, to excel all others, as much in the *Indigo*, as they have done in Rice, which will give a great Pleasure to

Your Humble Servant.

F I N I S.



